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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/451,965	11/30/1999	ROBERT F. SENZIG	15-CT-4697	9713

7590 06/16/2004

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EXAMINER	
SONG, HOON K	

ART UNIT	PAPER NUMBER
2882	

DATE MAILED: 06/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/451,965	SENZIG ET AL.	
	Examiner	Art Unit	
	Hoon Song	2882	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 May 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-36* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 December 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-12, 15-29 and 34-36 rejected under 35 U.S.C. 102(b) as being anticipated by Boyd et al. (US 5014293).

Regarding claims 1 and 36, Boyd teaches a method of generating an image of an object using a multimode imaging system configured to operate in a plurality of modes of operation including at least three modes (column 3 line 61), the multimode imaging system including a source assembly (32), a detector assembly (33), and a mechanical means (figure 2) for positioning the source assembly (32) and the detector assembly (33), the source assembly (32) attached to the mechanical means (C-arm) for positioning and including an x-ray source (32) configured to emit x-ray signals, the detector assembly (33) attached to the mechanical means (C-arm) for positioning and including a detector (33), said method comprising the steps of

selecting a first mode of operation comprising a computed tomography volume mode (column 4 line 7-10)

positioning the source assembly and the detector assembly in a first position using the mechanical positioning means for the first mode of operation, wherein the source assembly and the detector assembly are attached to the mechanical positioning

means and rotating the mechanical means for positioning about an angle of 180 degrees plus a fan angle while emitting x-rays form the x-ray source and collecting signals from the detector assembly in the first mode of operation (column 4 line 7-10);

selecting a second mode of operation (transverse tomosynthesis mode, figure 8, column 4 line 3-5)

positioning the source assembly (32) and the detector assembly (33) for the second mode (tomosynthesis mode) of operation in a second position different from the first position (see figures 8 and 9) using the mechanical positioning means (C-arm), wherein the source assembly (32) and the detector assembly (33) are attached to the mechanical positioning means (C-arm) (transverse tomosynthesis mode, figures 8-9, column 3 line 61 through column 4 line 10); and

generating an image of the object for each determined mode of operation, wherein, for the first mode of operation, said generating an image includes using said collected signals from the detector assembly in the first mode of operation (column 2 line 55-60).

Regarding claim 2, Boyd teaches that said selecting a second mode of operation, comprises the step of electing at least one of an x-ray fluoro mode and a tomosynthesis mode (transverse tomosynthesis mode, figure 8, column 4 line 3-5).

Regarding claim 3, Boyd teaches that positioning the source assembly and the detector assembly, said method comprises the step of rotating the detector assembly and the source assembly about the object (C-arm, figure 9).

Regarding claim 4, Boyd teaches an imaging system for generating an image of an object, said imaging system configured to operate in a plurality of modes (column 3 line 61) of operation including at least three modes and comprising:

a source assembly (32) comprising a movable x-ray source configured to emit x-ray signals (figure 10);

a detector assembly (33) comprising a movable detector (figure 10);

a mechanical positioning means (C-arm) for positioning said source assembly (32) and said detector assembly (33) relative to the object, said source assembly (32) movably attached to said mechanical positioning means and said detector assembly movably attached to said mechanical positioning means (figure 10, column 4 line 11-13); and

a controller (column 2 line 50-63) enabling an operator to selectively operate said system in a plurality of modes comprising a computed tomography volume mode (figure 9) and generate an image of the object for each determined mode of operation, wherein in said computed tomography volume mode, said mechanical positioning means is configured to rotate an angle of 180 degrees plus a fan angle while emitting x-rays from the x-ray source and collecting signals from the detector assembly, and to generate said image in said computed tomography mode utilizing said collected signals (column 4 line 7-10).

Regarding claim 5, Boyd teaches that said plurality of modes further comprises at least one of an x-ray fluoro mode and a tomosynthesis mode (transverse tomosynthesis mode, figure 8, column 4 line 3-5).

Regarding claim 6, Boyd teaches that said source (32) is configured to move relative to said positioning means to alter a distance from said source to said detector (33) (figures 8 and 10).

Regarding claim 7, Boyd teaches that said detector is configured to move relative to said positioning means to alter a distance from said detector to said source (figures 8 and 10).

Regarding claim 8, Boyd teaches that said source (32) and said detector (33) are aligned along a plane of interest, and wherein at least one of said source and said detector configured to move relative to other said assembly and said positioning means to alter said plane of interest (figure 8).

Regarding claim 9, Boyd teaches that a table (figure 5, where front wheel is located) for supporting the object, said source (32) and said detector (33) are movable relative said table (figure 5).

Regarding claim 10, Boyd teaches that said positioning means is movable relative to said table (figure 5).

Regarding claim 11, Boyd teaches that said detector comprises at least one detector panel (21).

Regarding claim 12, Boyd teaches that at least one said detector panel (21) is rotatable relative to said positioning means (C-arm) (figure 5).

Regarding claim 15, Boyd teaches that said positioning means comprises a base and an arm movably coupled to said base (C-arm, figure 2).

Regarding claim 16, Boyd teaches that said arm comprises a first end portion and a second end portion wherein said x-ray source assembly coupled to said arm first end portion, and wherein said detector assembly coupled to said arm second end portion (C-arm, figure 2).

Regarding claim 17, Boyd teaches that said positioning means comprises a base and a gantry rotatably coupled to said base (C-arm, figure 2).

Regarding claim 18, Boyd teaches an imaging system for generating an image of an object, said imaging system comprising a base (16), a mechanical positioning means (C-arm) movably attached to said base, an x-ray source assembly (32) comprising an x-ray source (32) configured to emit x-ray signals and attached to said mechanical positioning means (C-arm), and a detector assembly (33) comprising a detector (33) attached to said mechanical positioning means (C-arm), said system (figure 2) configured to:

enable an operator to select a mode of operation from a plurality of modes of the imaging system (column 3 line 61), said plurality of modes including a computed tomography mode (column 4 line 4-10) in which said mechanical positioning means rotates through an angle of 180 degrees plus a fan angle, said x-ray source emits x-rays and said detector assembly collects signals, and in which an image in said computed tomography mode is generated utilizing said collected signals (figure 9, column 4 line 4 line 10);

alter the position of said detector assembly and said source assembly relative to said other assembly and the object based on the selected mode (transverse tomosynthesis mode, figure 8, column 4 line 3-5); and

generate an image of the object.

Regarding claim 19, Boyd teaches that to enable the operator to select a mode said system is configured enable the operator to select at least one of an x-ray fluoro mode and a tomosynthesis mode (transverse tomosynthesis mode, figure 8, column 4 line 3-5).

Regarding claim 20, Boyd teaches that altering the position of said detector assembly and said source assembly, said system is configured to rotate said positioning means relative to said base so that said detector assembly and said source assembly are rotated about the object (column 4 line 7-10).

Regarding claim 21, Boyd teaches that altering the position of said detector assembly and said source assembly, said system is configure to move at least one of said source and said detector relative to said other assembly to alter a distance between said source and said detector (figure 10, column 4 line 11-13).

Regarding claim 22, Boyd teaches that said source and said detector are aligned along a plane of interest, and wherein to alter the position of said detector assembly and said source assembly, said system is configured to move at least one of said source and said detector relative to said other assembly to alter the plane of interest (transverse tomosynthesis mode, figure 8, column 4 line 3-5).

Regarding claim 23, Boyd teaches that move at least one of said source and said detector relative to said other assembly, said system is configured to translate at least one of said source and said detector parallel to the plane of interest (transverse tomosynthesis mode, figure 8, column 4 line 3-5).

Regarding claim 24, Boyd teaches that a table for supporting the object, and wherein to alter the position of said detector assembly and said source assembly, said system is configured to move said detector and said source relative to said table (figure 5).

Regarding claim 25, Boyd teaches that move said detector assembly and said source assembly relative to said table, said system is configured to rotate said detector assembly and said source assembly about said table (figure 5).

Regarding claim 26, Boyd teaches that generate an image of the object, said system is configured to radiate x-ray signals from said x-ray source toward said detector (figure 5).

Regarding claim 27, Boyd teaches that generate an image of the object, said system is further configured to collect image data (column 2 line 55+).

Regarding claim 28, Boyd teaches that said detector assembly (33) comprises at least one detector panel (33), and wherein to collect image data, said system is configured to detect x-ray signals utilizing a portion of at least one of said detector panel (2).

Regarding claim 29, Boyd teaches that detect x-ray signals utilizing a portion of at least one of said detector panel, said system is configured to alter a position of at least one of said detector panel (figure 8).

Regarding claim 34, Boyd teaches that said positioning means (C-arm) comprises an arm having a first end portion and a second end portion, wherein said x-ray source assembly (32) coupled to said arm first end portion, and wherein said detector assembly (33) coupled to said arm second end portion (figure 2).

Regarding claim 35, Boyd teaches that said positioning means comprises a gantry rotatably coupled to said base (figure 2).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 13-14 and 30-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boyd et al. in view of Nambu et al. (US 6196715B1).

Regarding claim 13-14 and 30-33, Boyd fails to teach that said detector comprises a first detector panel and a second detector panel and the first detector is angularly positioned relative to said second detector panel.

Nambu teaches a detector comprising a first detector panel and a second detector panel and the first detector is angularly positioned relative to said second detector panel (figure 42a).

It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the radiographic system of Boyd with the detector arrangement as taught by Nambu, since the detector arrangement of Nambu would match a resampling plane and a slice planes so that resampling process would be faster to reconstruct tomograms of a plurality of slices, independently on the shape of the detector or the movement direction (column 35 line 55-67)

Regarding claim 30-33, Nambu teaches that said detector assembly comprises a first detector panel and a second detector panel, and wherein to collect image data, said system is configured to angularly, obtuse, acute or perpendicular position (according to resampling surface) said first detector panel relative to said second detector panel (figure 42a, column 35 line 23-33).

Response to Arguments

Applicant's arguments with respect to claims 1-36 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hoon Song whose telephone number is (571) 272-2494. The examiner can normally be reached on 8:30 AM - 5 PM, Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Glick can be reached on (571) 272 - 2490. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DAVID V. BRUCE
PRIMARY EXAMINER

HKS 6/8/04